Research, Extension, and Education

Introduction

The Research, Extension, and Education Committee of the Kentucky Aquaculture Task Force was assigned the duty of reviewing, evaluating, and making recommendations on the status, future, and coordination of research, extension, and educational activities related to aquaculture within the commonwealth.

The only aquaculture programs in Kentucky are at KSU. A history and status of state programs will focus on that institution.

KSU Aquaculture Program History

Unlike several southern states which have aquaculture initiatives spread over several institutions, almost all aquaculture research, extension, and educational activities in Kentucky are based at KSU. Kentucky State University's interest and efforts in aquaculture date back to the late 1970s when interest in aquaculture among Kentucky citizens began to develop and information requests to the University of Kentucky's (UK) and KSU's Extension Programs increased dramatically. Officials from the commonwealth's two Land-Grant Universities (UK and KSU) met and agreed that KSU should be the school to take further steps in addressing the needs in this area.

In 1981, KSU's Land-Grant administrator and an extension specialist organized a fact-finding trip to allow University personnel and interested Kentucky farmers to gain first-hand knowledge of existing aquaculture programs in the country. Auburn University in Alabama served as host institution and agreed to assist KSU in the development of aquaculture research and extension capabilities.

Later in 1981 and at the request of KSU, Drs. Schmittou and Cremer of Auburn University's Department of Fisheries and Allied Aquacultures initiated an evaluation and feasibility assessment for aquaculture production in different physiographic regions of the commonwealth. As a result of the assessment, they also began plans for the development of an aquaculture extension program at KSU and the development of a research facility.

The resulting plan was approved by the University's Board of Regents in 1981. Design and construction of the Aquaculture Research Center was begun in 1982. Basic construction was completed in 1985. However, because substantial problems existed in the electrical service and integrity of the ponds, the facility did not become fully operational until 1986. In the interim, personnel utilized cooperators' ponds in the Franklin County area to begin research on the culture of catfish and rainbow trout in cages. During this period, Dr. Cremer served a split appointment as Extension Aquaculture Specialist and Principal Investigator. In 1983, Dr. Gary Jensen (now USDA's National Aquaculture Extension Coordinator) was hired as State Aquaculture Specialist and Dr. Cremer's appointment became 100% research. From that time on, Aquaculture Research and Extension Programs became distinct, though tightly connected. In 1999, the Research and Extension Programs and the new Academic Program were merged into a combined administrative unit.

Facilities

Kentucky State University's Aquaculture Research Center is the only such facility located in the commonwealth of Kentucky. Facilities at the Aquaculture Research Center include 35 research ponds and a 2,000 square foot hatchery housing spawning, holding, and experimental tanks. A 4,000 square foot office/laboratory building houses a state-of-the-art histology laboratory, offices, and conference/classroom space. A 3,500 square foot nutrition laboratory contains a wet laboratory for aquarium studies, a feed preparation/water quality laboratory, office/computer space, and an analytical laboratory. A 3,000 square foot greenhouse facility contains temperature control systems capable of evaluating three temperature levels in nine 1,500 gallon tanks, as well as a recirculating shrimp hatchery system. A second 3,000 square foot greenhouse, built in 1998, contains four 10,000 gallon tanks for broodstock holding and conditioning. These facilities may be utilized for student research and teaching.

The program also includes a Fish Disease Diagnostic Laboratory housed on campus in the Cooperative Extension Building. This lab is fully equipped with incubators, microscopes, and video microscopy.

Personnel

James H. Tidwell, Ph.D., Coordinator of Aquaculture Programs (Research, Extension, and Education), also Principal Investigator on freshwater shrimp and largemouth bass projects.
Steven D. Mims, Ph.D., Principal Investigator on paddlefish, sturgeon, and crappie projects.
Carl D. Webster, Ph.D., Principal Investigator on aquaculture nutrition projects.
Robert M. Durborow, Ph.D., State Specialist for Aquaculture, Fish Disease Diagnostic Laboratory.
William A. Wurts, Ph.D., State Specialist for Aquaculture, Western Kentucky.
Forrest S. Wynne, M.S., Area Aquaculture Extension Specialist, Eastern and South Central Kentucky.

The Aquaculture Research Center also has 10 other full-time employees including a Ph.D. level scientist (Dr. Boris Gomelsky) supported by grant funds, two M.S. level research assistants (RA), two B.S. level R.A.s, a B.S. level Facility Manager, and four full-time technical and support personnel.

Research

The goal of the KSU Aquaculture Research Program is to increase the knowledge base in aquaculture and thereby facilitate increases in farm income and the productivity of on-farm water resources. This is to be accomplished by examining and developing production technologies suitable for the climatic and physiographic conditions prevalent in Kentucky. To meet these goals, the KSU Aquaculture Research Program's initial goals have been development and adaptation of pond and cage culture techniques for channel catfish and trout, as they are the principal species of the Kentucky fish farming industry.

Goals

The USDA expects newly developing aquaculture species to experience rapid expansion in the

next decade by adapting existing production and processing systems already developed for catfish and trout. Development of these species is expected to occur largely in states which, like Kentucky, do not currently have well established production, processing, or marketing infrastructures for aquaculture. It is the intent of research, extension, and education efforts to assist Kentucky producers to be a part of this future development by investigating alternative aquaculture species that can be produced profitably in Kentucky.

Extension

Research information is of little practical value unless it is communicated to producers in a useful and understandable form. Training and extension programs serve as the primary means of transferring this knowledge from the researchers to the end users. KSU Aquaculture Specialists are integrated into the UK Cooperative Extension System. Specialists are housed in western Kentucky at the UK Princeton Research and Extension Center (Dr. Wurts), central Kentucky at KSU main campus (Dr. Durborow), and in eastern Kentucky at the Rural Development Center in Somerset (Mr. Wynne).

Teaching/Education

Kentucky State University began offering a Minor in Aquaculture in 1992 within the Division of Mathematics and Sciences. Since that time, over 75 students have been involved in the aquaculture courses at KSU. No other university in the commonwealth offers an aquaculture curriculum. In 1998, the Council on Post-secondary Education approved KSU to offer a Master of Science in Aquaculture/Aquatic Science beginning fall semester of 1999. This program has been designated as a Program of Distinction through the Regional University Excellence Trust Fund set up by House Bill 1 in 1998.

Teaching aquaculture and developing experiential learning activities have rapidly developed at the secondary level. Scattered over different regions of the commonwealth, 47 high schools and vo-ag programs currently have aquaculture activities. These efforts are extremely important for increasing awareness of aquaculture among young Kentuckians while their minds are still open to new enterprises.

Long-term Vision

To achieve desired goals, KSU should remain as the lead program in the commonwealth based on expertise and over 70 years of cumulative Kentucky aquaculture experience. State support should be added to federal support to expand services, coverage, and flexibility. This should include augmentation of existing facilities, increased support for personnel and students, and the possibility of adding satellite facilities in different physiographic regions of the commonwealth.

Recommendations

The following recommendations are based on discussion within the Research, Extension, and Education Subcommittee and within the full Task Force. Implementation of many of these recommendations has already begun.

1) The KDA, KSU, and the KAA should hold a joint annual aquaculture conference to promote

industry awareness. The conference should also include a trade show.

2) KSU should develop a master reference book for county extension agents to source aquaculture information to the public.
3) The KSU extension offices should be granted funds to produce needed aquaculture publications of Kentucky-specific species manuals.
4) KSU should be funded according to the same formula as UK in obtaining state funding for extension work.
5) Appropriate funds should be granted to KSU and/or KAA to assist high school vocational agricultural teachers to start aquaculture education programs. This should include support for a KSU position dedicated to assisting high school programs statewide.
6) State funds should be appropriated to KSU researchers, to research and solve local and regional problems and to develop aquaculture opportunities.
7) Support for graduate student assistantships is essential.
8) Additional field assistance is needed.
9) Additional research facilities at KSU are necessary to support rapid development of new species' culture and production methods.
10) Research and demonstration facilities should be established in different regions of the state due to differences in species of interest and production conditions across the commonwealth.